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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/617,596	07/07/2000	Grant McGibney	LAMA115733	6394

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EXAMINER

WONG, BLANCHE

ART UNIT PAPER NUMBER

2667

DATE MAILED: 05/06/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/617,596

Applicant(s)

MCGIBNEY, GRANT

Examiner

Blanche Wong

Art Unit

2667

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-16 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5 and 6 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date #11, Apr 16, 2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. **Claims 1-3** are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Cupo et al. (U.S. Pat No. 6,377,566).

With regard to claim 1, Cupo discloses a communication method (col. 3, ln. 19-37 for methods of transmitting and receiving using OFDM) comprising the steps of:

receiving (col. 3, ln. 29-37 for method of receiving a shuffled data stream) an information bearing OFDM signal (col. 3, ln. 31-32 for a shuffled input data stream) at a receiver 130 (Fig. 1B), where the information bearing OFDM signal (col. 3, ln. 31-32 for a shuffled input data stream) is carried by each sub-carrier of a set of carriers (col. 3, ln. 32 for transmitted over a plurality of subcarriers using OFDM) allocated to the receiver 130 (Fig. 1B);

constructively combining (col. 3, ln. 33-37 for unshuffling the shuffled input data stream) the sub-carriers at the receiver 130 (Fig. 1B) to produce a combined signal (col. 3, ln. 33-34 for an output data stream); and

extracting the information from the combined signal (col. 3, ln. 33-35 for an output data stream with respect to a plurality of services; see also col. 3, ln. 35-37 for un-shuffling based on a control signal).

With regard to claim 2, Cupo also discloses the communication method of claim 1 (see above) in which there are M sub-carriers (col. 6, ln. 1-5) in the set of sub-carriers and constructively combining (col. 3, ln. 33-37 for unshuffling the shuffled input data stream) the sub-carriers comprises the steps of:

sampling (col. 2, ln. 14-26, there are three groups of OFDM subcarriers, 1 to N1, N1+1 to N1+N2, and N1+N2+1 to N1+N2+N3) the information bearing OFDM signal to generate a sampled signal (col. 3, ln. 33-34 for an output data stream) having a spectrum and being formed of samples;

decimating the sampled signal by retaining (it is inherent in OFDM that by positioning the signals, the main lobe of each sub-carrier lines up with the zeros of all the other nodes) each Mth sample and discarding (if the main lobe of each sub-carrier lines up with the zeros of all the other nodes, then there is interference between sub-carrier and discarding is unnecessary) each other sample to produce a decimated signal formed of M frequency scaled and frequency shifted copies of the spectrum (additionally, OFDM is a more efficient use of radio spectrum because OFDM does not require guard bands, and therefore frequency shifted copies of the spectrum is unnecessary) of the sampled signal; and

recovering the combined signal (col. 3, ln. 33-34 for an output data stream) by accumulating the samples (col. 2, ln. 14-26, there are three groups of OFDM subcarriers, 1 to N1, N1+1 to N1+N2, and N1+N2+1 to N1+N2+N3) at a selected frequency.

With regard to claim 3, Cupo also discloses the communication method of claim 2 (see above) in which the selected frequency is zero (Fig. 2 starts at zero) and accumulating the samples (col. 2, ln. 14-26, there are three groups of OFDM subcarriers, 1 to N1, N1+1 to N1+N2, and N1+N2+1 to N1+N2+N3) at a selected frequency.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 5 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Cupo (U.S. Pat No. 6,377,566) in view of Zimmermann et al. (U.S. Pat No. 6,522,700).

With regard to claim 5, Cupo discloses the communication method of claim 1. However, the combination fails to show expressly transmitting the information bearing OFDM signal from a transmitter to a receiver, wherein in transmitting the information

bearing OFDM signal comprises phase rotating the sub-carriers so that the sub-carriers add constructively at the receiver, as recited in claim 5.

In an analogous art, Zimmermann discloses transmitting the information bearing OFDM signal 110 (OFDM signal generator) from a transmitter 10 (transmitter) to a receiver, wherein in transmitting the information bearing OFDM signal comprises phase rotating 90 (frequency interleaver)(col. 2, ln. 22-34; col. 5, ln. 25-53) the sub-carriers (col. 3, ln. 60-62; col. 4, ln. 8-10) so that the sub-carriers add constructively at the receiver, as recited in claim 5.

A person of ordinary skill in the art would have been motivated to employ Zimmermann in the combination of AT&T and Cupo in order to obtain an OFDM transmitter with phase rotating that can combine with an OFDM receiver. The suggestion/motivation to do so would have been to further develop the existing DAB transmission system for added-value services. Zimmermann, col. 1, ln. 38-42. At the time the invention was made, therefore, it would have been obvious to one of ordinary skill in the art to which the invention pertains to combine Cupo and Zimmermann to obtain the invention as specified in claim 5.

With regard to claim 6, Zimmermann also discloses each subcarrier is associated with a corresponding channel 30 (channel encoder)(col. 2, ln. 1-2), and each corresponding channel has a gain (col. 4, ln. 8-34, data substreams can be of different lengths), and the gain of each corresponding channel has a magnitude 32,34,36 (convolution encoders)(col. 4, ln. 31-32, each convolution encoder generate one

encoded data substream), and in which transmitting the information bearing OFDM signal further comprise weighting each sub-carrier 60 (downstream time interleaver) with the magnitude of the channel corresponding to the sub-carrier.

Allowable Subject Matter

3. **Claims 7-16** are allowed.
4. **Claims 4** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
5. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to show or suggest an OFDM transmitter, comprising: a multiplier connected to each of the source of IPDM data packets and the code table for multiplying the data packets by the code symbols, as recited in claim 7.

The prior art of record fails to show or suggest an OFDM transmitter in which the code symbols form a number of repetitions of a base code sequence, as recited in claim 8.

The prior art of record fails to show or suggest a base code sequence that comprises: plural base codes, each base code has a base code spectrum, each spectrum has a magnitude, and the base code sequence is selected so that the magnitude of each base code spectrum is the same at each of the OFDM sub-carriers, as recited in claims 9 and 14.

The prior art of record fails to show or suggest an OFDM transmitter having a combination/connection of a source of OFDM data packets, a code table, a multiplier, an D/A converter, an LP filter and an RF converter, as recited in claims 10,11,13.

The prior art of record fails to show or suggest an OFDM receiver and transmitter comprising: an OFDM sampler having samples as output; a decimator connected to receive the samples from the OFDM sampler and retain each Mth sample while discarding all other samples; and an accumulator connected to receive each Mth sample from the decimator and having as output summer decimated samples corresponding to a constructive combination of the OFDM sub-carriers, as recited in claims 12 and 15.

The prior art of record fails to show or suggest a wireless terminal having a OFDM transmitter that comprises: a code table having as output code symbols whose frequency spectrum contains one or more OFDM sub-carriers, where the code symbols being formed from a number of repetitions of a base code sequence, as recited in claim 13.

The prior art of record fails to show or suggest a method of receiving an information bearing OFDM signal transmitted from multiple terminals using sub-carriers comprising: for each terminal, recovering the values of each sub-carrier allocated to the terminal with a DFT, as recited in claim 16.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ring (U.S. Pat No. 6,430,148) discloses a multidirectional communication systems, including OFDM sub-channels (sub-carriers). The incoming signals are transformed into a plurality of sub-channel signals which include the N1 wanted sub-channel signals transmitted by the opposite transmitter, and the desired N1 sub-channel signals are passed through a multi-channel demodulator, and through an FEC decoder, to recover the original data signal. Col. 7, ln. 11-22).

Kishimoto et al. (U.S. Pat No. 6,314,083) discloses a frequency control device and method for frequency synchronization with multiplex signal by OFDM, receiving device, and communication device. It includes an OFDM signal input, a reproduced carrier generating section, and DFT circuit.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Blanche Wong whose telephone number is 703-305-8963. The examiner can normally be reached on Monday through Friday, 830am to 530pm.

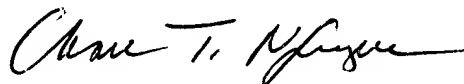
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi H Pham can be reached on 703-305-4378. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Bw

BW
April 11, 2004



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